# J. GRAHAM.

## Oil-Cup.

No. 167,332. Patented Aug. 31, 1875.

FIG. 2.

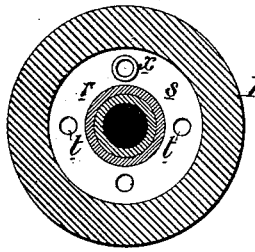



FIG. 1.

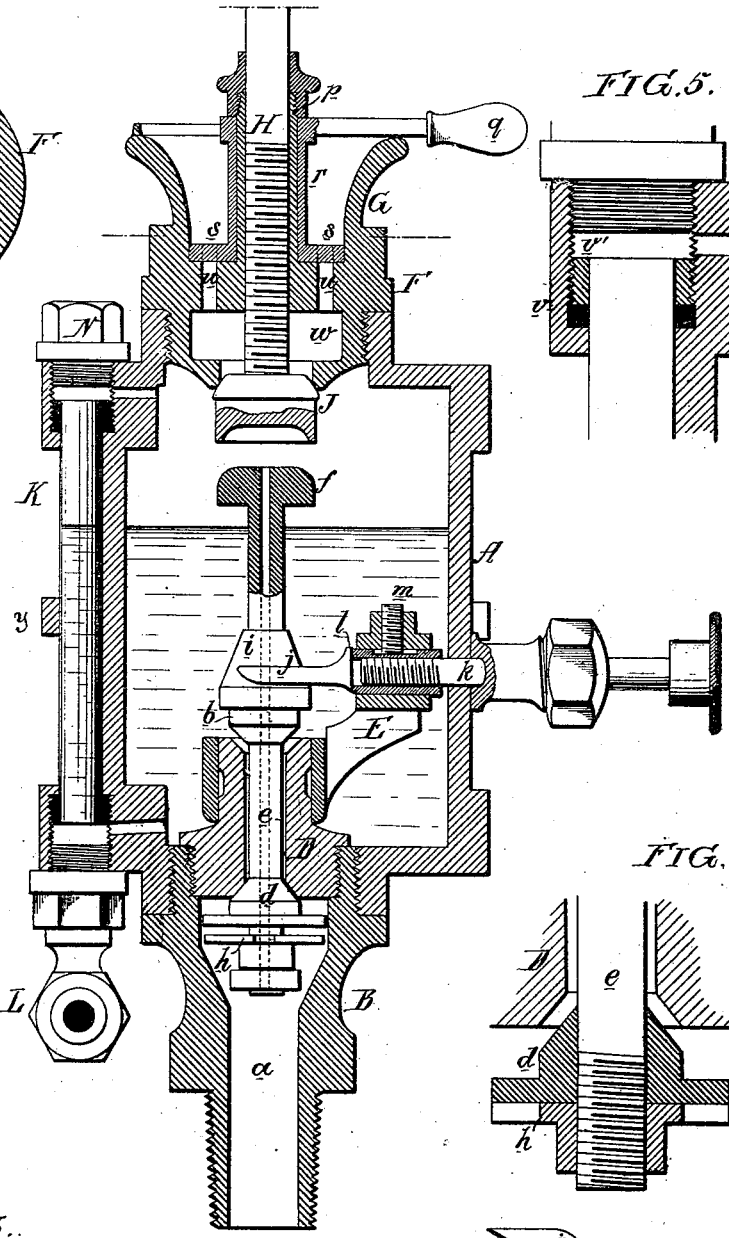



FIG. 5.




FIG. 6.




FIG. 3.

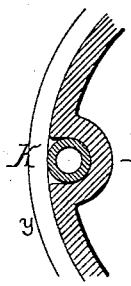
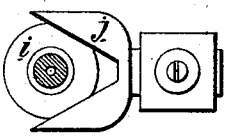



FIG. 4.




Witnesses,
Hubert Howson
Harry Smith

John Graham
by his Attorneys
Howson and Sons

# UNITED STATES PATENT OFFICE.

JOHN GRAHAM, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO GEORGE R. KIRK, OF SAME PLACE.

## IMPROVEMENT IN OIL-CUPS.

Specification forming part of Letters Patent No. **167,332**, dated August 31, 1875; application filed April 7, 1875.

*To all whom it may concern:*

Be it known that I, JOHN GRAHAM, of Philadelphia, Pennsylvania, have invented certain Improvements in Oil-Cups, of which the following is a specification:

My invention relates to improvements in that class of oil-cups which are applied to the cylinders or valve-chests of steam-engine pumps, &c., and in which the valves are operated by the pulsations of steam within the said cylinder or chest for the purpose of discharging intermittent supplies of oil; and the objects of my improvements are to readily regulate the lift of the valve, to protect the test-gage from injury, and to afford facilities for replenishing the cup with oil without detaching any of its parts, and these objects I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 represents a vertical sectional view of my improved oil-cup; and Figs. 2, 3, 4, 5, and 6 detached views, illustrating different features of my invention.

A is the casing of the oil-cup, provided at the bottom with a tubular screw-plug, B, which is adapted to a threaded opening in the cylinder or steam-chest of the engine, and has an internal chamber, *a*, to the upper end of which is adapted the hollow screw-plug D, and on the top of the latter is formed a seat for the valve *b*, and on the under side for a valve, *d*. The valve *b* is attached to, and the valve *d* is arranged to slide freely upon, a central hollow spindle, *e*, which extends up into the interior of the cup to a point above the level of the oil in the same, and is provided at its upper end with a head, *f*. To the lower end of the spindle *e* is attached a slotted ring, *h*, the purpose of which will be explained hereafter. Attached to the spindle *e*, immediately above the valve *b*, is a conical sleeve, *i*, which is embraced by a forked arm, *j*, (see Figs. 1 and 4,) connected to a sleeve, *l*, sliding in a bearing formed on a bracket, E, and advanced and retracted by a screw-spindle, *k*, the movement of the sleeve being limited by a set-screw, *m*, which projects into a slot in the said sleeve, as shown in Figs. 1 and 4. The opening in the top of the cup is closed by a screw-plug, F, the upper portion G of which is cup-shaped, and has a central tubular stem, *p*, to which is adapted the screw-spindle H. The latter carries at its lower end the valve J, the under side of which is adapted to the head of the stem *e*, and the upper portion to a seat in the screw-plug F. The stem *p* is embraced by a sleeve, *r*, provided above with a handle, *q*, and below with a flange, *s*, having perforations *t*, which, when the sleeve is turned to a given position, correspond with passages *u* formed in the body of the plug F, and communicating below with a chamber, *w*, the outlet of which, into the interior of the oil-cup, is closed under ordinary circumstances by the valve J. A tube, *x*, extends upward from one of the openings *t* of the flange *s*, for a purpose explained hereafter. The body of the oil-cup is recessed at one side (see Fig. 3) for the reception of the glass gage-tube K, the central rib *y* of the body A extending across the recess, in order to protect the glass tube from injury. (See Figs. 1 and 3.) The tube K communicates both at the top and bottom with the interior of the cup through suitable passages, and a waste-cock, L, communicates with the chamber at the bottom of the tube, so that the water of condensation can be readily drawn off from time to time. The manner of securing the glass tube in place is shown more fully in Fig. 5, a packing-ring, *v*, being first laid in the end of the chamber, so as to surround the tube, and a screw-ring, *v'*, is then tightened against the packing, so as to force it tightly against the tube, the chamber being closed by a screw-plug, N.

The operation of the above-described oil-cup is as follows: Supposing the cup to be applied to one end of the cylinder of a steam-engine, when steam is admitted to the said cylinder it will gain access to the chamber *a*, and will first force the valve *d* into its seat, and then act on the slotted ring *h*, and elevate it, and consequently the stem *e* to which it is attached, until the conical sleeve *i* comes in contact with the forked arm *j*, and the upper valve *b* is lifted to the proper extent, as shown in Fig. 1. Steam passes freely through the central opening of the stem *e*, and presses upon the surface of the oil in the cup,

so that as soon as the valve *b* is raised oil will be forced into the opening in the plug D, surrounding the stem. When steam is exhausted from the cylinder the valve *b* will, owing to the weight of the stem *e*, and its connection, first fall into its seat, and the valve *d* will then be opened, as shown in Fig. 6, so as to permit the escape of the oil which finds it way from thence into the cylinder. When it is desired to replenish the cup with oil the valve J is depressed until it fits over the enlarged head *f* of the stem *e*, and closes its opening at the same time the exit-opening from the chamber *w* is exposed. The cup-shaped portion G of the plug F is then filled, or nearly filled, with oil, and the flange *s* so turned, by means of its handle, that its perforations *t* coincide with the passages *u*, through which and through the chamber *w* the oil passes into the cups, the air escaping through the tube *x*, which projects above the surface of the oil. When the oil-cup has been replenished the valve J is again elevated until the opening in the chamber *w* is closed, and that on the stem *e* again uncovered.

It will be evident that in an oil-cup constructed as above described the lift of the valve can be adjusted to a nicety, and that the cup can be replenished with oil without requiring the detachment of any of its parts, while the glass gage, being contained within the body of the cup, is effectually protected by the same from accidental fracture.

A sleeve having a series of steps may be substituted for the conical sleeve *i*.

I claim as my invention—

1. The combination, in an oil-cup, of the two valves *b* and *d*, with the conical sleeve *i* and forked arm *j*, all substantially as set forth.

2. The gage-tube K, contained within a recess in the side of the cup, across the front of which recess extends a rib, *y*, as and for the purpose set forth.

3. The combination of the sleeve *r* and its perforated flange *s*, with the passages *u* and chamber *w* in the plug F, and with the valve J, all substantially as and for the purpose set forth.

4. The combination of the hollow stem *e* and its head *f*, with the valve J, all substantially as set forth.

5. The combination of the sliding valve *d*, with the stem *e*, its fixed valve *b*, and ring *h*, all substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN GRAHAM.

Witnesses:

HUBERT HOWSON,

HARRY SMITH.